ABSTRACT OF THE DISCLOSURE

One embodiment of the present invention generates random samples for a Bernoulli distribution. A first covariance matrix is generated using a desired mean vector and a desired covariance matrix of the Bernoulli distribution. A normal vector is constructed using the desired mean vector and the first covariance matrix. A sampling vector is generated using the normal vector and a threshold vector. The sampling vector has the desired mean vector and the desired covariance matrix.